

case of billing the trim on a job at the same time as the frames, but not turning the trim bills in to the mill for a month afterward. In such a case the superintendent should leave the bills undated until ready to put them through, and then date them level with their entry into the mill.

There are two types of billing for cutting, and superintendents and foremen are divided in their favor, some preferring one because of its completeness and the ease with which the work is followed, and some favoring the other because of its compactness and the facility with which it may be cut and checked.

The first system makes a complete piece bill for every size of article, such as window frames, so that a frame the same length as others, but two inches wider, would call for another list of the same number of items which would be the same for all the vertical pieces, but two inches longer for the horizontal members. This method calls for a heading or title for each page, describing the article to be made out of the pieces enumerated. Sometimes there may be a dozen or a hundred of the same kind, and in this case it is no more trouble to make a bill for one than for all. Where the stuff is sent out in the knock-down, this system is a good one, as the material is accompanied by the triplicate bills, and the carpenters may sort out the different lengths by the bills and may be as familiar with the work as the man at the mill.

One of the serious objections to this plan is that in case of a large and varied order, the work will cover all the way from ten to thirty or forty pages, and the yardman, sawyer, cutter, joiner and some others must look all these tickets over in order to cut and work the material, each one checking as he goes with a check of his own. While this takes time, it has the valuable feature of proving the work all the way through, and if any of the material gets lost on the way the check marks will show who had it last.

This system works very nicely when just enough of the other method is applied to take the burden of searching the tickets from so many of the different employees. This can be done by the assistant superintendent or the mill foreman bunching all the similar pieces from the various tickets into one item and giving out this list for the men to work from, and requiring only the stock man to check from the whole lot of piece bills. In case the work is made up in the mill, the carpenters will use the regular bills to work by, and the bunch bill need not go farther than the machine men.

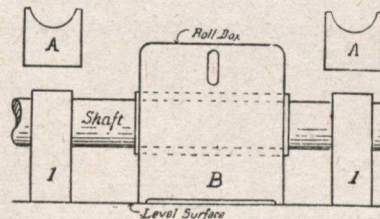
As has already been hinted, the second system of billing will be composed of a list of the different pieces required on the whole job, grouped in such a manner that all the pieces of a size are in one item, and all the items of a kind follow each other in the order of their length, the longest coming first.

Like the other system, this requires a heading, but in this case all the units—that is, frames, sides of trim or whatever the class of work may call for—must head the piece bill. This often requires a different sized sheet from the ordinary, if it is to carry all the items on the job, but it is a long and varied bill of frames that may not be billed on a sheet 8 x 20 inches. By putting down a few notations it will be possible for the bench men to work from this bill nearly as intelligently as from the other and more elaborate billing. In any case, the bills should be made out in a regular and fixed order, so that the various workmen will always know where to look for any particular item.

—A drop or two of oil once a day is better than a quart once a year.

BABBITTING PLANER ROLLS.

To rebabbitt the roll boxes on a planer, matcher or moulder is generally a tedious operation. As a rule, the boxes are solid, and in babbitting, the shaft having become somewhat the worse for wear, the babbit will grip the shaft so tightly it is nearly impossible to get the box separated from the shaft.



I have adopted a system of babbitting rolls which have removable and adjustable boxes, which is simple enough after one gets the lines fully figured out. The method consists of two blocks of hardwood like AA, this being the end view. These blocks are exact duplicates, and are for the purpose of resting the babbitting arbor in the notches on a level bench, thus holding it at the required height, supporting the shaft, or really the babbitting arbor, an equal distance from the box, thus making each box exactly the same. By having the box out of the machine one can get at it, and it is much easier than to do the job in the machine. B shows the box in position for babbitting, the two blocks of wood (11) at each end, with the babbitting arbor through the box.

In babbitting solid bearings, in order to make a complete and smooth job, the shaft or arbor should be wrapped with paper, after being heated just so hot that it is impossible to hold it in the hands. This heating is to thoroughly expand the shaft, so that when the metal contracts it will not grip the shaft. Heat the box equally hot, and you will be surprised to see how much tighter the metal will be in the box when it cools off. When metal is poured into cold castings it chills, and as it cools, contracts, and the result is the metal is loose in the box. The box and metal thus contract together, consequently the metal remains tight.

It is a good plan, when trying to get a shaft out of the bearing, to heat the frame as well as the shaft.—A. B. C.

JOINTING SEGMENTS FOR PATTERN-MAKING.

Of all the artisans working in wood to-day, the pattern-maker probably is most dependable upon the tools of his hand and upon his skill in directing them in the myriad requirements of the mechanical draftsman and designer. Long ago cabinetmaking became more or less set in form through the agency of the mill. The carpenter of the present does little more than tack together the products of the saw, plane and milling machines of a dozen varieties. The pattern-maker, however, must take the soft pine materials in the bulk, lump his materials in sufficient bulk to contain the design, and then saw and cut and plane and gouge through his blocked and glued mass until the draftsman's blue print lines have materialized to a hair-breadth.

In is in this infinite variety of pattern intricacies that the pattern-maker has the element of novelty in his work, while from the point of view of working with the simple tools of the craftsman he may put more of himself into his work than does almost any other of the skilled workmen of the time.

In engines, steam pump, air compressor, and, in fact, almost every kind of manufacture, the pattern-maker is often